BUILDING PANEL HAVING A FOAM BACKED FIBER CEMENT SUBSTRATE

This application is a division of U.S. patent application Ser. No. 11/874,413, filed Oct. 18, 2007, which is a division of U.S. patent application Ser. No. 10/955,405, filed Sep. 30, 2004, both of which are expressly incorporated by reference herein in their entireties.

FIELD OF THE INVENTION

The present invention relates to building materials generally, and more specifically to fiber cement exterior building materials.

BACKGROUND

For more than 100 years, asbestos fiber cement materials were prevalent in such building products as roofing. In the 1980's, as the dangers of asbestos became known, replacement building materials were sought.

One proposed replacement for asbestos has been unbleached cellulose fibers, with about 35% cement, and about 55% fine ground silica, such as described in U.S. Pat. No. 6,030,447, the entirety of which is hereby incorporated by reference. This product is autoclave (steam heat and pressure) cured. It is generally made on a Hatschek machine. Cellulose fiber cement building products have surged in popularity in recent years. A variety of products are available in fiber-cement, including siding, shakes, and panels. Fiber cement products are strong and durable. Advantages of fiber cement products include consistent quality and excellent dimensional stability, class 1 (A) fire rating, imperviousness to wood-boring insects, resistance to damaging effects of salt spray and UV rays, and rot resistance.

However, cellulose fiber cement materials do not perform as well as asbestos fiber cement materials in that the cellulose fiber cement materials have lower resistance to water induced damage, higher water permeability, higher water migration ability (also known as wicking) and lower freeze thaw resistance when compared to asbestos cement composite materials. These drawbacks are largely due to the presence of water conducting channels and voids in the cellulose fibers. The pore spaces in the cellulose fibers can become filled with water when the material is submerged or exposed to rain/condensation for an extended period of time.

U.S. Patent Application Publication No. 2003/0056458 is incorporated by reference herein in its entirety. This publication describes a fiber cement panel in the form of horizontal planks or laps that have a strong "shadow line" or perceived thickness such that individual planks can be discerned from a distance without further increases in thickness of the fiber cement, to maintain a low material cost, weight and to maintain handling characteristics of long siding planks. The fiber cement plank assembly is comprised of a fiber cement siding plank, a region for fastening the siding plank to a mounting surface, and a locking overlap region on an inner surface of the siding plank near the lower end of the plank. The locking overlap region allows the fiber cement siding plank to be stacked with other siding planks in a manner such that the region for fastening of an adjacent plank is covered by the locking overlap region, and wherein the locking overlap region sets the gauge of the exposed plank face and allows for leveling of the plank during installation. The lock may include compressible regions, which allow the planks to be easily interlocked during installation and provides lateral compensation for non-planar mounting surfaces. The compressible material can also act as a seal against wind and rain. Thus, the compressible material helps prevent infiltration of water into the fiber cement plank.

An improved fiber cement product and methods of making the same are desired.

SUMMARY OF THE INVENTION

In some embodiments, a product comprises a fiber cement substrate, and a porous, closed cell foam joined to a substantial portion of a major surface of the fiber cement substrate.

In some embodiments, a product comprises a fiber cement substrate and a closed cell foam joined to a substantial portion of a major surface of the fiber cement substrate, at least one major surface of the foam having a plurality of grooves therein.

In some embodiments, a method comprises: providing a fiber cement substrate, and joining a porous, closed cell foam to a substantial portion of a major surface of the fiber cement substrate.

In some embodiments, a method comprises: providing a unitary panel, section of siding, soffit, shingle or shake including a fiber cement substrate and a porous, closed cell foam joined to a substantial portion of a major surface of the fiber cement substrate. The panel, section of siding, soffit or shake is mounted on a building surface.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1**A is a left side elevation view of an exemplary embodiment of a section of foam backed fiber cement siding.

FIG. **1**B is a left side elevation view showing two sections of siding as shown in FIG. **1**A, installed on an exterior surface of a building.

FIG. **1**C is a rear elevation view of the section of siding shown in FIG. **1**A.

FIG. **1**D is a front elevation view of the sections of siding shown in FIG. **1**B.

FIG. **1**E is an enlarged detail of FIG. **1**A.

FIG. **2**A is a front elevation view of an exemplary shake panel.

FIG. **2**B is a right side elevation view of the shake panel of FIG. **2**A.

FIG. **2**C is a left side elevation view showing two of the shake panels of FIG. **2**A, mounted to a building member with the foam facing towards the building member.

FIG. **2**D is a left side elevation view showing two of the shake panels of FIG. **2**A, mounted to a building member with the foam facing away from the building member.

FIG. **3**A is a left side elevation view of a variation of the section of foam backed fiber cement siding shown in FIG. **1**A.

FIG. **3**B is a left side elevation view showing two sections of siding as shown in FIG. **3**A, installed on an exterior surface of a building.

FIG. **4**A is a left side elevation view of an exemplary embodiment of a foam backed fiber cement panel.

FIG. **4**B is a left side elevation view showing two panels as shown in FIG. **4**A, installed on an exterior surface of a building.

FIG. **5**A is a left side elevation view of a variation of a foam backed fiber cement panel.